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What is claimed is:

1. An annealing system for a semiconductor processing platform, comprising a plurality of isolated annealing chambers, each of the isolated annealing chambers comprising:

a heating plate positioned in an enclosed processing volume and configured to support a substrate thereon in a substantially face up orientation;

a cooling plate positioned in the enclosed processing volume and configured to support a substrate thereon in a substantially face up orientation;
and

a substrate transfer mechanism positioned in the processing volume and configured to transfer substrates between the heating plate and the cooling plate.

2. The annealing system of claim 1, wherein the heating plate comprises a substantially planar upper substrate receiving surface having at least one vacuum chucking aperture formed therein.

3. The annealing chamber of claim 2, wherein the heating plate comprises at least one of a resistive heating element and an inductive heating element positioned in an interior portion of the heating plate below the substrate receiving surface.

4. The annealing system of claim 1, wherein the cooling plate comprises a substrate support member having at least one of a liquid cooling channel formed into an interior portion thereof and a thermoelectric cooling device positioned in an interior portion thereof.

5. The annealing system of claim 1, wherein the cooling plate comprises at least one vacuum aperture formed into an upper surface thereof.

PATENT

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6. The annealing system of claim 1, wherein the substrate transfer mechanism comprises a pivotally actuated robot arm having a distal substrate supporting blade positioned thereon.

7. The annealing system of claim 6, wherein the substrate support blade further comprises a plurality of inwardly facing substrate support tabs positioned below a main upper body portion of the support blade, the support tabs being positioned to support the substrate via contact with a backside of the substrate.

8. The annealing system of claim 7, wherein the heating plate and the cooling plate further comprise a plurality of notches formed into a perimeter thereof, the plurality of notches being configured to receive the plurality of inwardly facing substrate support tabs when the robot blade is lowered toward the heating and cooling plates.

9. The annealing chamber of claim 1, wherein the plurality of isolated annealing chambers further comprise at least 3 stacked annealing chambers, each of the at least three stacked annealing chambers being fluidly separated from each other.

10. The annealing chamber of claim 1, further comprising a gas source in fluid communication with an interior volume of each of the annealing chambers, the gas source being configured to supply an inert gas to the processing volumes to maintain the oxygen content below about 100 ppm.

11. An annealing station for a semiconductor processing system, comprising:
a plurality of individual annealing chambers, each annealing chamber defining an isolated processing volume;
a heating plate positioned in the processing volume;
a cooling plate positioned in the processing volume; and

PATENT

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a substrate transfer robot positioned to receive a substrate from an externally positioned robot in a face up orientation and position the substrate onto the heating plate and the cooling plate in the face up orientation.

12. The annealing station of claim 11, wherein the individual processing volumes are fluidly isolated from each other.

13. The annealing station of claim 11, wherein the substrate transfer robot comprises:

a pivotally and vertically actuatable arm member; and

a blade member attached to a distal end of the arm member, the blade member having a plurality of inwardly extending substrate support tabs positioned thereon that are configured to engage a backside of a substrate.

14. The annealing chamber of claim 13, wherein the heating plate and the cooling plate further comprise a plurality of vertically oriented channels formed into a perimeter of the plates, wherein the vertically oriented channels are configured to receive the inwardly extending substrate support tabs with the blade is lowered to the plane of the plates.

15. The annealing chamber of claim 11, wherein at least one of the heating plate and the cooling plate comprises a vacuum aperture formed into an upper substrate supporting surface, vacuum aperture being configured to chuck a backside of the substrate to the respective plate.

16. The annealing chamber of claim 11, further comprising a fluid channel formed into an outer body portion of each of the plurality of individual annealing chambers, the fluid channel being in fluid communication with a cooling fluid source.

PATENT

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17. The annealing chamber of claim 11, wherein the heating plate is configured to heat a non-production surface of the substrate positioned thereon.

18. The annealing chamber of claim 11, further comprising a resistive heating element positioned in an interior portion of the heating plate.

19. The annealing chamber of claim 11, further comprising a sealable access door positioned in an outer body portion of the chamber.

20. The annealing chamber of claim 11, further comprising a vacuum source individually in communication with each of the processing volumes, the vacuum source being configured to generate a reduced pressure in each of the processing volumes.

21. The annealing chamber of claim 11, further comprising a processing gas supply selectively in communication with each of the annealing chambers.

22. A method for annealing a substrate, comprising:
positioning the substrate in an annealing chamber;
sealing the annealing chamber and removing a portion of ambient gases therefrom;

supplying a processing gas to the annealing chamber;
positioning the substrate on a heating plate for a first predetermined period of time, the heating plate being maintained at a temperature of between about 200° C and 400° C; and

positioning the substrate on a cooling plate for a second predetermined period of time, the cooling plate being configured to cool the substrate to a temperature of between about 50° C and 100° C in less than about 30 seconds.

23. The method of claim 22, wherein removing a portion of the ambient gases comprises pumping the processing gas into the annealing chamber and pumping

PATENT

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ambient gases out of the annealing chamber such that an oxygen content in the annealing chamber is less than about 100 ppm.

24. The method of claim 22, wherein supplying the processing gas comprises flowing at least one of argon, hydrogen, nitrogen, helium, and mixtures thereof into the chamber.

25. The method of claim 22, further comprising vacuum chucking the substrate to an upper surface of the heating plate and the cooling plate.